CLAIMS

We claim:

1   1.   A method of creating a value change dump (VCD) file for a modeled design on demand,

2   comprising steps:

3   selecting a simulation session range which begins at a simulation time t0 and ends at a

4   simulation time t3;

5   selecting a simulation target range which begins at a simulation time t1 and ends at a

6   simulation time t2, wherein the simulation time t1 is greater than or equal to simulation time t0

7   and simulation time t2 is less than or equal to simulation time t3;

8   generating a VCD file of the modeled design for the selected simulation target range; and

9   accessing the VCD file directly from simulation time t1 to debug the modeled design.

1   2.   The method of claim 1, further comprising steps:

2   providing primary inputs to the modeled design for evaluation; and

3   recording a simulation history for the simulation session range.

1   3.   The method of claim 2, further comprising steps:

2   processing the simulation history; and

3   evaluating in the modeled design the processed simulation history from simulation time t0

4   to simulation time t2.

1   4.   The method of claim 3, wherein the step of generating the VCD file further comprises:

2   generating evaluated results from the modeled design based on the processed simulation

3   history; and

4   saving the evaluated results during the simulation target range into the VCD file.

1   5.   The method of claim 4, wherein the step of recording further comprises steps:

2   compressing the primary inputs; and

3   recording the compressed primary inputs as the simulation history.

1 6.   The method of claim 4, wherein the processing step further comprises:

2   decompressing the compressed primary inputs; and

3   providing the decompressed primary inputs as the processed simulation history to the

4 modeled design for evaluation

1 7.   The method of claim 4, wherein the recording step includes the step of:

2   recording the primary inputs as the simulation history.

1 8.   The method of claim 1, further comprising steps:

2   saving state information of the modeled design at simulation time t0 in a first file; and

3   saving state information of the modeled design at simulation time t3 in a second file.

1 9.   An electronic design automation system for verifying a user design, comprising:

2   a computing system including a central processing unit and memory for modeling the user

3 design in software;

4   an internal bus system coupled to the computing system;

5   reconfigurable hardware logic coupled to the internal bus system and for modeling at least

6 a portion of the user design in hardware;

7   control logic coupled to the internal bus system for controlling the delivery of data

8 between the reconfigurable hardware logic and the computing system; and

9   VCD on-demand logic for recording a simulation history for a selected simulation session

10 range and dumping state information from the hardware model into a VCD file for a selected

11 simulation target range, where the simulation target range is within the simulation session range.

1 10.   The electronic design automation system of claim 9, wherein the VCD on-demand logic

2 further comprises:

3   first range selection logic for selecting a simulation session range which begins at a

4 simulation time t0 and ends at a simulation time t3;

5   second range selection logic for selecting a simulation target range which begins at a

6 simulation time t1 and ends at a simulation time t2, wherein the simulation time t1 is greater than

7 or equal to simulation time t0 and simulation time t2 is less than or equal to simulation time t3;

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8   dump logic for generating a VCD file of the hardware-modeled design for the selected

9   simulation target range; and

10   access logic for accessing the VCD file directly from simulation time t1 to debug the user

11   design.

1   11.   The electronic design automation system of claim 10, wherein the VCD on-demand logic

2   further comprises:

3   test bench process for providing primary inputs to the hardware-modeled design for

4   evaluation; and

5   recording logic in the computing system for recording a simulation history for the

6   simulation session range.

1   12.   The electronic design automation system of claim 11, wherein the VCD on-demand logic

2   further comprises:

3   process logic in the computing system for processing the simulation history; and

4   evaluation logic in the reconfigurable hardware logic for evaluating in the hardware-modeled

5   design the processed simulation history from simulation time t0 to simulation time t2.

1   13.   The electronic design automation system of claim 12, wherein the dump logic dumps the

2   evaluated results from the hardware-modeled design based on the processed simulation history

3   during the simulation target range into the VCD file.

1   14.   The electronic design automation system of claim 13, wherein the recording logic further

2   comprises:

3   compression logic for compressing the primary inputs; and

4   write logic for writing the compressed primary inputs as the simulation history.

1   15.   The electronic design automation system of claim 14, wherein the process logic further

2   comprises:

3   decompression logic for decompressing the compressed primary inputs; and

4   data transfer logic for delivering the decompressed primary inputs as the processed

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5   simulation history to the hardware-modeled design for evaluation.

1   16.   The electronic design automation system of claim 13, wherein the recording logic further

2   comprises:

3   write logic for writing the primary inputs as the simulation history.

1   17.   The electronic design automation system of claim 9, further comprising:

2   state save logic for saving state information of the hardware-modeled design at simulation

3   time t0 in a first file and saving state information of the hardware-modeled design at simulation

4   time t3 in a second file.

1   18.   A VCD on-demand system for providing evaluated information for a selected simulation

2   target range of simulation times, the evaluation occurring in modeled design, comprising:

3   first logic for selecting a simulation session range which begins at a simulation time t0 and

4   ends at a simulation time t3;

5   second logic selecting a simulation target range which begins at a simulation time t1 and

6   ends at a simulation time t2, wherein the simulation time t1 is greater than or equal to simulation

7   time t0 and simulation time t2 is less than or equal to simulation time t3;

8   generation logic for generating a VCD file of the evaluated information for the selected

9   simulation target range; and

10   access logic for accessing the VCD file directly from simulation time t1 to debug the

11   modeled design.

1   19.   The VCD on-demand system of claim 18, further comprising:

2   compression logic for receiving and compressing primary input data for the duration of the

3   simulation session range; and

4   decompression logic for decompressing the compressed primary input data and delivering the

5   decompressed primary input data into the modeled design for evaluation.

1   20.   The VCD on-demand system of claim 19, wherein the generation logic further comprises:

2,   dump logic for dumping evaluated information to the VCD file, the evaluated information

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1   generated by the evaluation of the decompressed primary inputs by the modeled design.